DEPARTMENT OF
ECOLOGY
State of Washington

Technical Support Document for Northwest Pipeline LLC Sumas Compressor Station PSD 01-08 Amendment 5

Prepared by

Air Quality Program
Washington State Department of Ecology
Olympia, Washington

May, 2020

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

The Northwest Pipeline LLC (NWP) operates a natural gas pipeline system from the Washington-Canada border near Sumas, Washington, to the San Juan Gas Fields in New Mexico. The gas pipeline system serves commercial, industrial, utility, and cogeneration customers in Washington, Oregon, Nevada, and California. Northwest Pipeline proposes to:

- Monitor the carbon monoxide (CO) using a portable emission analyzer at least once every 4,380 hours of operation.
- Remove the requirement to verify the accuracy of portable analyzers.

Ecology's assessment of Northwest Pipeline's request:

- Approves:
    - The proposed monitoring frequency.
    - Accuracy verification of the portable analyzers is not needed because there is sufficient quality assurance in the test method itself.

- Amendment makes requirements more clear.

The facility is located about 1.4 miles east of Sumas. The area is designated as meeting national air quality standards (in attainment).

After reviewing Northwest Pipeline's request, Ecology proposes to approve this request.This technical support document shows Ecology's review and more detail explanation of the revisions.

2. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) IN WASHINGTON STATE

PSD permitting requirements in Washington State are established in Washington Administrative Code (WAC) 173-400-700 through 750. Washington State implements its PSD program as a State Implementation Plan (SIP)-approved program. This SIP-approved program became effective May 29, 2015[1].

The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere by a proposed new major source, or major modification to an existing major source. The program limits degradation of air quality to that which is not considered "significant." PSD rules require the utilization of BACT for certain new or modified emission units, which is the most effective air pollution control equipment and procedures that are determined to be available after considering environmental, economic, and energy factors.

PSD rules are designed to keep an area with "good" air in compliance with the NAAQS. The distinctive requirements of PSD are BACT, air quality analysis (allowable increments and

[1] 80 FR 23721, April 29, 2015.

comparison with the NAAQS), and analysis of impacts of the project on visibility, vegetation, and soils.

3. PROJECT AND SITE DESCRIPTION

A. Project description

Northwest Pipeline LLC (NWP) has requested amendment to the PSD 01-08 Amendment 4 to revise the Carbon Monoxide (CO) monitoring requirements for the Mars 90S combustion turbines. NWP proposes to monitor the CO emission using portable emission analyzer at least once every 4,380 hours of operation, less frequent than the existing monitoring requirement in the permit. NWP also proposes to remove the requirement to verify the accuracy of portable analyzers.

B. Site description

The Northwest Pipeline LLC operates a natural gas pipeline system from the Washington-Canada border near Sumas, Washington to the San Juan Gas Fields in New Mexico. The gas pipeline system serves commercial, industrial, utility, and cogeneration customers in Washington, Oregon, Nevada, and California. The Sumas and Mount Vernon stations are two of many natural gas compressor stations located approximately every 50 miles along the pipeline.

The NWP Sumas Compressor Station is

- about 50 kilometers (km) from the nearest Class I area, North Cascades National Park.
- 1.4 miles east of Sumas and immediately south of the U.S.–Canadian border.
- located at 49ºN 00’05” latitude, 122ºW 13’19” longitude, UTM coordinates of 557.0 kilometers east and 5,427.5 kilometers north
- located within a Class II area that is currently designated in attainment for all national and state air quality standards

C. PSD Permit History

PSD 01-08 issued October 18, 2002

The permit authorized the installation and operation of the folllowings:

- three Solar Mars 90S turbine driven centrifugal compressors (each rated at 12,841 horsepower @ 59ºF).
- one natural gas-fired Caterpillar 270 kilowatt (kW) generator unit for backup power.
- one natural gas-fired Sellers C60 boiler/heater rated at 2.5 million British Thermal Units per hour.

Two of the new Solar Mars 90S replaces the two existing turbines (unit # 7 & 8) onsite.

Carbon monoxide (CO) emission increase from the project triggers PSD review based on the netting analysis conducted. See table below compares the CO and NOx potential emissions from

the proposed project against the actual emissions of the removed equipment. The netting analysis determined that CO is the only pollutant that has a significant net emissions increase.

Pollutant	Emission Rate (ton/year)				Subject to PSD
	Past Actual [1]	Potential	Net Increase	Significant Emission Rates	
NOx	89.9	127.1	37.2	40	No
CO	8.5	140.5	132.0	100	Yes
Note[1] Past actual baseline emission rate based on 1/99 to 12/00.					

Best Available Control Technology (BACT) determinations for CO emissions are:

- Good Combustion Practices for the Mars 90S turbines.
- Three way non-selective catalyst for the Caterpillar 270 kW backup generator.
- Good Combustion Practices for the Sellers C60 boiler/heater.

PSD 01-08, Amendment 1 issued July 15, 2004

NWP and Ecology discovered the inability of the Predictive Emissions Monitoring System (PEMS) to accurately predict realtime emissions. This finding was based upon completion of one year of PEMS data gathering and analysis, and Ecology agreed with NWP. There were no changes to emission limits in the first amendment.

PSD 01-08, Amendment 2 issued August 10, 2004

It was to implement changes requested by Northwest Pipeline Corporation (NWP) that were intended to clarify and streamline the permit. Condition 2.4 was removed. This condition required an initial performance demonstration for a CO concentration limit for the standby generator that did not exist in the original permit. There were no changes to the emission limits in the second amendment.

PSD 01-08, Amendment 3 issued on June 14, 2006

It was to allow a reduction in the required frequency of carbon monoxide (CO) routine monitoring testing. A portable emissions analyzer is used for these routine monitoring tests. More than three years of testing every 14 days showed that routine testing every 28 days was sufficient to monitor compliance. There were no changes to emission limits in the third amendment.

PSD 01-08, Amendment 4 issued October 6, 2011

It was to clarify and simplify CO monitoring procedures used by portable CO monitors in preparation for renewal of the facility's Title V permit. Testing using a portable analyzer to monitor the volume percent of CO every 336 hours has proven adequate to indicate compliance, so the additional calculation of CO mass flow during these periodic tests is no longer required (Approval Condition 5.5.1). If noncompliance is indicated by a portable monitor test, the turbine will now be shut down as soon as reasonably possible and repaired rather than have further emissions testing (Approval Condition 5.5.1.3). No compliance testing conditions for CO

(Reference Method 10) are affected by these changes, but the CO limit's averaging time is reduced from a three to one hour time period, which is more stringent. No physical changes are requested.

D. Affected Emission Unit (s)

The emission unit (s) affected by this permit are listed below.

Emission Unit Description	Design Capacity
Solar Mars 90 gas turbine	100.03 MMBtu/hour @ 59°F
Solar Mars 90 gas turbine	100.03 MMBtu/hour @ 59°F
Solar Mars 90 gas turbine	100.03 MMBtu/hour @ 59°F
Sellers C-60 water heater/boiler	2.5 MMBtu/hour
Caterpillar emergency electrical generator –natural gas fired	270 kW

4. PERMIT CONDITIONS REVISION DISCUSSION

Ecology reorganizes and streamlines the permit conditions, including removing the obsolete langauges with this permit revision. The original condition language in PSD 01-08, Amendment 4 is included as attachment to this technical support document for ease of comparing the changes. Some of the more significant and note worthy changes are discussed below.

Monitoring Frequency

Based on the existing permit requirements, Mars 90S combustion turbines are subject to CO emission limit of 50 parts per million on a dry volumetric basis (ppmdv) over a 1-hour average when corrected to 15.0 percent oxygen. Compliance with the emission limit is determined by EPA RM10, and NWP is required to conduct the compliance test annually.

In addition to reference menthod test, the existing permit also requires that NWP monitors the CO concentration at least once every 336 hours of turbine operation using portable analyzer. If six consecutive monitoring results show that the CO concentration is below the emission limit, the monitoring frequency can be reduced to at least once every 672 hours of turbine operation.

NWP proposes to monitor the CO emission using portable emission analyzer at least once every 4,380 hours of operation.

Based on Statement of Basis for the Title V permit issued on June 19, 2019, the combustion turbines approved under this permit have been meeting the CO limit.

Considering the compliance history, Ecology finds that annual compliance demonstration using EPA reference method and monitoring once every 4,380 hours of operation using portable analyzer should be sufficient to ensure compliance.

Portable Analyzer Accuracy Verification

NWP also proposes to remove the requirement to conduct accuracy verification of the portable analyzer. The existing permit condition requires NWP to develop a protocol to verify the accuracy of the portable analyzer and conduct the accuracy test each calendar year. To verify the accuracy, NWP compares the measured concentration using portable analyzer, compare to the concentration determined by independent lab using reference methods.

Ecology agree to remove the accuracy verification requirements. Ecology finds that this requirement is unnecessary since Conditional Method 34 is sufficient to ensure good measurement results for the monitoring purpose. Conditional Method 34 consists of repeatability check that ensure that the accuracy shall not vary more than ± 3 percent or ± 1 ppm. In addition to the repeatability check, the method also contains requirements to conduct a pre-test and post-test calibration with each test using certified calibration gases. The pre and post calibration results must be less than or equal to ±8% of the span gas value or ±2 ppm, whichever is less restrictive.

Access and Sampling Ports Requirements

This permit amendment removes Condition 7 of PSD 01-08, Amendment 4. The condition requires NWP to provide access and sampling ports for testing. Ecology finds that it is unnecccesry to include this condition in the PSD permit since WAC 173-400-105(4) and Appendix A of 40 CFR 60 provide equivalent requirements. These requirements are currently included in the facility's Title V Permit (AOP).

Inspection and Entry

This permit revision removes permit condition no.12 in PSD no.01-08 Amendment 4 which ensure federal, state and local agency right of entry for inspection. However, Ecology finds that it is unnecccesry to include this condition in the PSD permit since WAC 173-401-630(2) serves the same purpose and is included in the facility's Title V Permit (AOP).

Obsolete Language in PSD 01-08, Amendment 4

2.3. A three-way catalytic converter shall be installed on the standby generator. ~~It shall be Model EQ-601-08-C2 or another model that is approved by Ecology in writing prior to installation.~~

8. ~~NWP shall notify Ecology and NWCAA when construction commences on each of the turbines, the generator unit, and the boiler/heater, and when each is placed into service.~~

5.4. NWP shall demonstrate compliance with Condition 5.1 and Condition 5.2 initially and annually thereafter:
   5.4.1. ~~Initial compliance shall be demonstrated within 180 days after initial start-up, performed by an independent testing firm~~. Annual compliance shall be

demonstrated no sooner than 10 months after the previous test and no later than 13 months after the previous test.

5.4.2. Compliance shall be demonstrated in accordance with 40 CFR 60 Subpart GG and 40 CFR 60 Appendix A, Method 10 except that the instrument's span shall be reduced as appropriate.

5.4.3. NWP shall submit a test plan to Ecology and NWCAA for approval at least 30 days prior to testing. NWP shall submit a complete test report to the NWCAA no later than 60 days after completion of the tests. 5

5. STATE ENVIRONMENTAL POLICY ACT (SEPA)

The Skagit County issued a State Environmental Policy Act (SEPA) Determination of Nonsignificant (DNS) on May 21, 2002, originally for the project. The proposal does not change the scope that was covered under the original SEPA determination. The revised permit conditions also is not expected to have additional environmental impact.

Ecology will incorporated the original SEPA DNS issued by reference for this action.

6. ENVIRONMENTAL JUSTICE (EJ) REVIEW

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Ecology conducts an EJ review to ensure no group of people bear a disproportionate share of the negative environmental consequences as the result of the permitting action.

Ecology finds that the EJ review is not needed because there is no emission increase as the consequences of this permitting action.

7. PUBLIC INVOLVEMENT

This PSD permitting action was subject to a minimum 30-day public comment period under WAC 173-400-740. Ecology posts the public notice on Ecology's web site and accept public comment from March 25, 2020 through April 27, 2020.

Ecology did not receive any comment during the comment period for this project.

8. AGENCY CONTACT

MengChiu Lim, P.E.
Washington State Department of Ecology
Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600
(360) 407-6812
mengchiu.lim@ecy.wa.gov

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
ALW	Alpine Wilderness
AQIA	Air Quality Impacts Analysis
AQRV	Air Quality Related Values
BACT	Best Available Control Technology
CARB	California Air Resources Board
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
FLAG	Federal Land Managers' Air Quality Relative Values Workgroup
FLM	Federal Land Manager
FR	Federal Register
GHG	greenhouse gas
H_2SO_4	sulfuric acid mist
HAPs	hazardous air pollutants
hr/yr	hours per year
kW	kilowatt
MACT	maximum achievable control technology
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOC	Notice of Construction
NO_X	nitrogen oxides
NPS	National Park Service
NSR	New Source Review
PM	particulate matter
PM_{10}	particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometers in diameter

ppb	parts per billion
ppm	parts per million
PSD	Prevention of Significant Deterioration
PSCAA	Puget Sound Clean Air Agency
PTE	potential to emit
Q/d	emissions to distance
RBLC	RACT/BACT/LAER Clearinghouse
SCR	selective catalytic reduction
SEPA	State Environmental Policy Act
SER	significant emission rate
SIL	significant impact level
SO_2	sulfur dioxide
SO_X	sulfur oxides
TAP	toxic air pollutant
tpy	tons per year
VOC	volatile organic compound
WAC	Washington Administrative Code